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The Transatlantic Telegraph.

At last accounts from England, the work of shipping the submarine telegraph cable was going briskly forward, both on board the *Niagara* and the *Agamemnon*. Upon the latter, they were taking in fifty-four miles in every twenty-four hours, working day and night, and up to Monday evening, the 6th of July, they had got six hundred and sixty-nine miles on board. The whole was expected to be on board the *Agamemnon* by the 20th, so that by the 25th the vessel would be on her way to Cork, to join the *Niagara*. We have received various suggestions with regard to different precautions, etc., to be taken in laying it, which we have not noticed, as the attempt to lay the cable will be made, or the job postponed till another year, before any hints can reach the parties having the undertaking in charge.

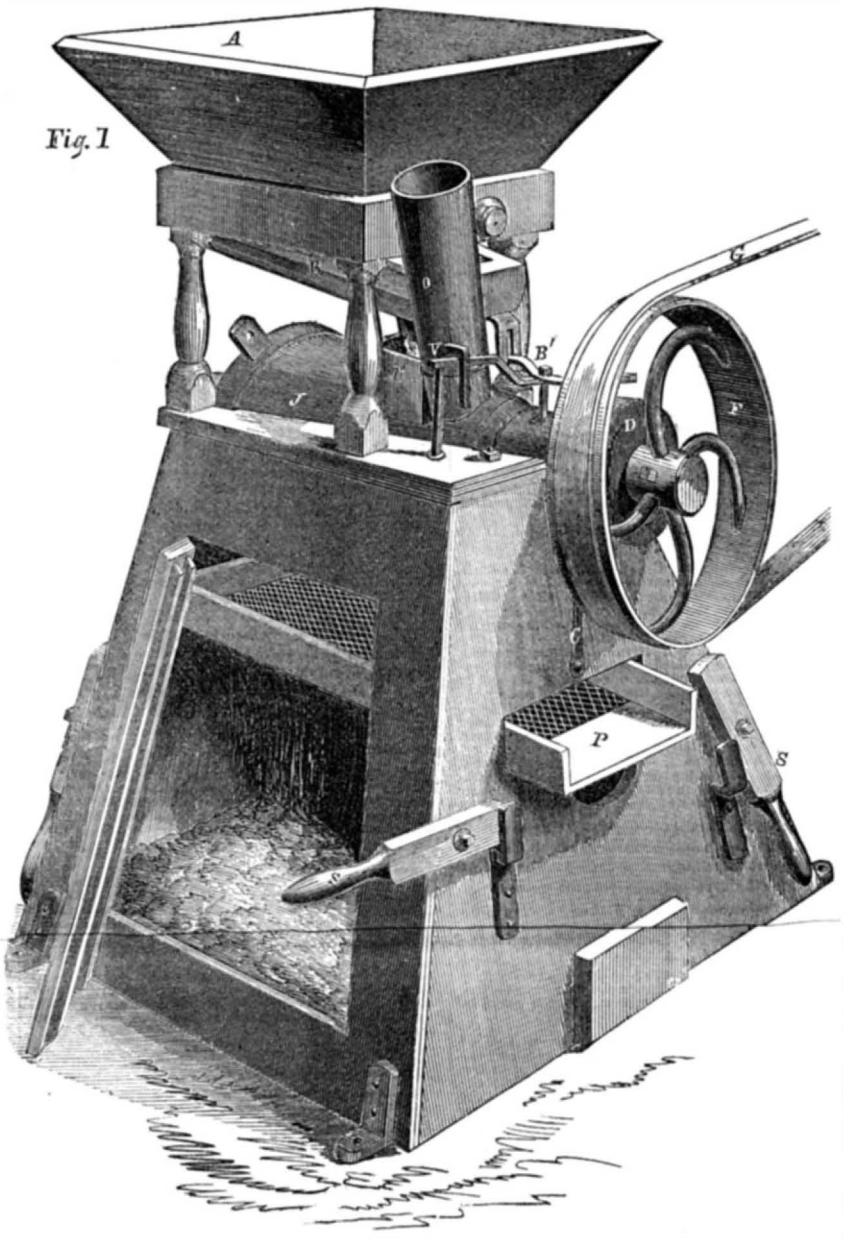
Improved Grinding Mill.

The accompanying figures represent E. Coleman's mill for grinding corn, either shelled or on the ear. It is capable of grinding with all the fineness necessary for farm purposes, and of feeding the ears at a variable rate, according to the power available for impelling it. In grinding shelled corn, the feed is, of course, very readily adjustable by the ordinary means. Fig. 1 is a perspective view of the whole, Fig. 2 is a longitudinal section through the grinding portion alone, and Fig. 3 is a transverse section on the line, X X, shown in Fig. 2. The section, Fig. 2, is taken on the line, T T, in Fig. 3.

A is the hopper in which the shelled corn is placed, B is the shoe which leads it to the mill, and B′ is a lever which is operated to shake the shoe, by the aid of a vertical rod, C, which is acted on by an eccentric, D, on the main shaft. F is the driving pulley, and G the belt. H is the shaft, on which is firmly fixed the principal grinding cone, I. This cone is grooved spirally, as is also the interior of the concave, J, in which it works, and by means of a screw, not represented, at the larger end of the concave, the shaft H, and consequently the cone I,, may be moved endwise, so as to grind coarser or finer at pleasure. There is a longitudinal groove on the shaft H, at the smaller end of the concave, as represented in Fig. 2, and on this portion of the shaft is loosely mounted the cob-grinding cone, K, which, by the aid of the feather V, is secured to H in such manner that the latter is free to move endwise without imparting any corresponding change of position, but necessarily carries K around with it as it revolves. The concave is enlarged at this point, as represented, and carries in its interior an independent portion of a smaller concave, L, which is provided with teeth, M M. The teeth on K are made in a curved form, as shown distinctly in Fig. 3, and crush the cobs very rapidly, and discharge the fragments, with the grain, into the larger portion of the cone. A′ is the tube through which the material is supplied in grinding shelled corn, and O is an independent tube or passage through which the larger masses are fed when grinding whole ears. The ears dropped in O feed themselves down to the action of the teeth, K M, according to an adjustable device now to be described.

COLEMAN'S GRINDING MILL.

Fig. 1



The semi-concave, L M M, is capable of a partial revolution within the enlarged concave represented, but is secured in any desired position by the screw, T, and nut N. By slackening the nut, N, the concave, L, may be readily turned into the position represented by the dotted lines, in which case the ears will be supported at a much higher lever than when in the position represented; or, if more power be available, as, for example, if two horses be employed instead of one, the concave L may be inclined as much in the opposite direction, and the ears of corn allowed to drop much lower, so as to be exposed in a much greater degree to the action of K, and be torn in pieces much more rapidly in consequence.

Fig. 2

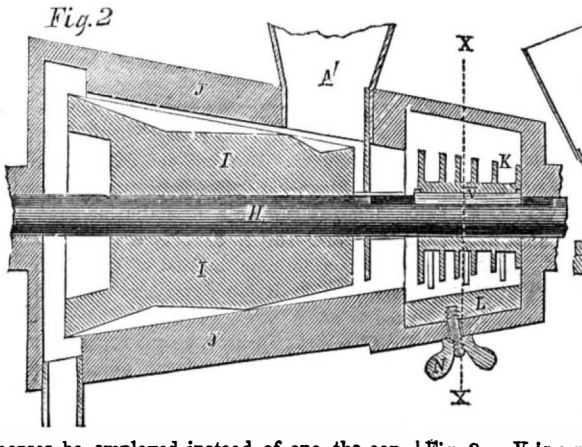
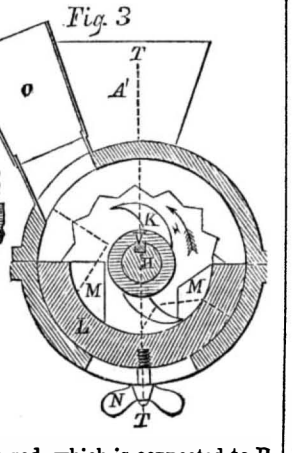


Fig. 3



P is a sieve hung below the mill to receive the discharge which escapes from the small passage represented at the lowest point in Fig. 2. V is a rod which is connected to P, and rising through the frame is hooked over an arm projecting from the shaking lever B′. V thus imparts a rapid shaking motion to the sieve, by which the fine material is separated from the coarser masses of cob, &c., which are ejected at the side as represented. S S are small handles by which the whole machine may be taken up and moved at pleasure.

The machine is small, exceedingly portable, and very well adapted to all the purposes of the farmer. By moving the shaft, H, axially, the meal is discharged finer or coarser at pleasure, while by adjusting the elevation of the shoe, B, in the ordinary manner, the flow of shelled grain is regulated; or by adjusting the position of L by the pinching nut N, the rate at which ears is consumed is easily controlled, so as to correspond with the power, and never allow the mill to become clogged. This machine was patented June 23, 1857.

For further information address the inventor, Ezra Coleman, room 42, corner of Elm and Franklin streets, this city, where the machine may be seen in operation.

Wood against Iron in a Trial of Speed.

Two yachts are now building by Captains R. B. and J. M. Forbes, of Boston, alike in all particulars of model, bulk, etc.—the one built of wood, the other of iron. It is said that one of the designs of this twin construction is to test the merits of wood and iron in sailing over a given distance in a given time, in order, as is supposed, to be able to determine how far vessels are affected in their speed by those materials. The following are their dimensions:—57 feet long, 17 1-2 feet, extreme breadth, 8 feet depth, including trunk and of 4 1-2 feet draft of water, with furniture and ballast on board. They have center-boards, are pilot-boat rigged and raked; foremast 57 feet long, mainmast 60 feet, with a bowsprit of 14 feet outboard. The iron yacht is named *Edith*, the wooden one *Azalea*. This may all be very interesting to yacht clubs generally, but so far as the merits of wood or iron in reference to speed alone are involved, we do not think the experiment can furnish such results as seem anticipated. Almost any other quality could be better tested than the speed of these vessels upon this basis. Their strength, buoyancy, stability, difference in distance between the center of gravity of vessel and that of her sails, all interpose and conspire to frustrate the determination of the question of material in this experiment, and will render any inference deceptive in the extreme. If the relative buoyancy, strength, capacity or stability of the vessels as constructed, were the questions at issue, they might be readily determined, but the speed, however widely it may differ in the two vessels, cannot in any measure, except in friction, be attributable to the kind of materials of which the yachts are built.—*U. S. Nautical Magazine.*

Enterprise in Mexico.

Recent advices from Mexico represent that railroad enterprises are attracting much attention. The road from the city of Mexico to Guadaloupe—a short one—has been finished, and its opening celebration was to take place on July 4th, a day, by the way, becoming quite popular with the Mexicans, judging from its frequent selection for public celebrations. The engineer of this road, Robert S. Gorsuch, is an American, and has the honor of completing the first railroad in Mexico. The Tacubaya road is being pushed forward rapidly, and will probably be opened for operation in August.

Attention is being turned to a new route for the Vera Cruz Railroad, viz.: to effect a connection with the city of Mexico by a branch leading from near the middle of the Vera Cruz and Acapulco road, so as to save half of either road. If there is danger of failure in either or both of these enterprises, such a step might be advisable.

To preserve flowers in water, mix a little carbonate of soda in it, and it will keep them a fortnight.

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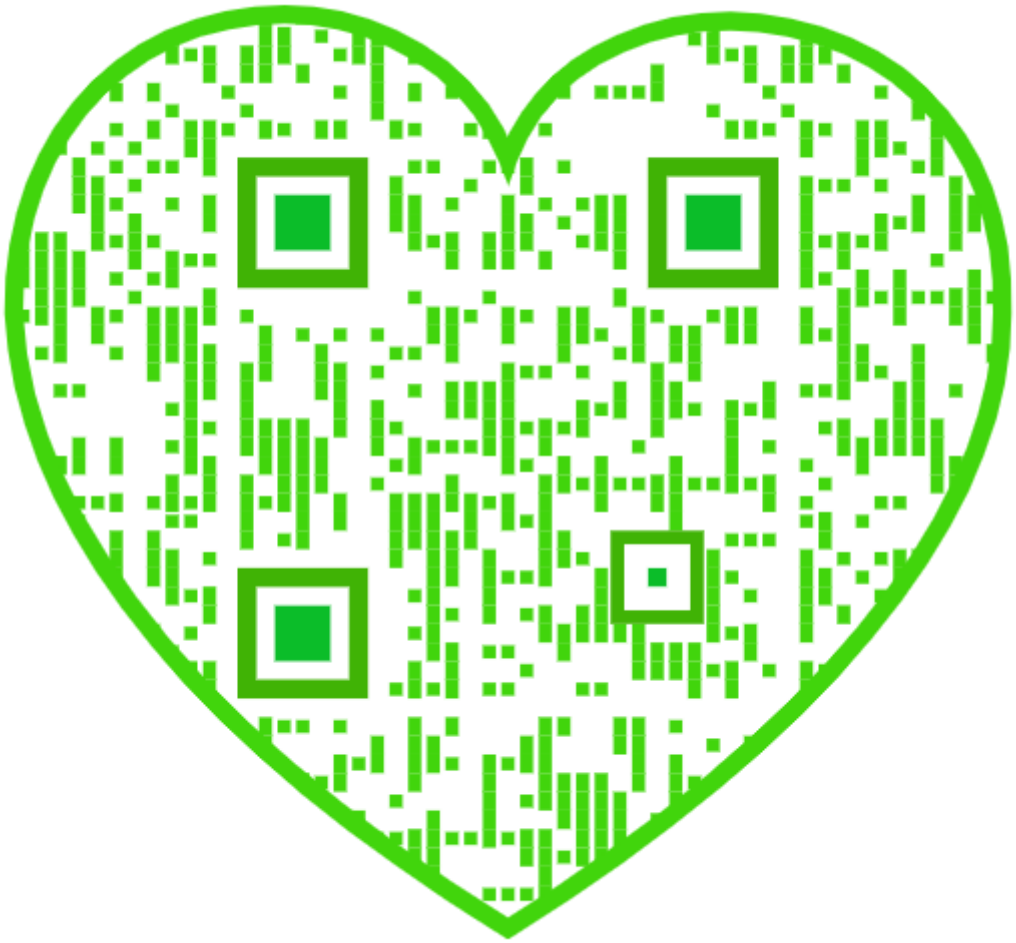

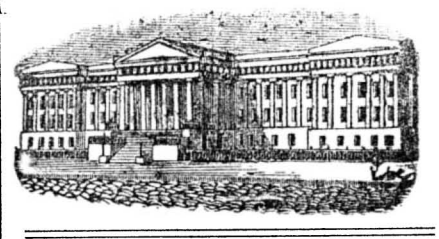

[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 21, 1857.

INKING ROLLERS—E E. Barrett, of Chicago, Ill.: I claim saturating or coating the inking roller of a printing press with ink, in the manner substantially as and for the purposes set forth.

SEWING MACHINES—Abm. Bartholf, of New York City: I claim first, Giving the necessary motion to the feeding wheel, substantially as described, through the agency of a collar E, or its equivalent, which by being turned in one direction around a central shaft fitted loosely in said wheel, is caused to move longitudinally on the said shaft towards the wheel, and thus clamp the wheel in one direction parallel with the length of the shaft against the flanch b, or its equivalent, fast on the shaft, and thus to carry with it both the shaft and wheel in a circular direction, but which, on being turned in the reverse direction, is caused to move in the reverse direction parallel with the shaft, and thus to liberate the shaft from the feed wheel and allow it to return without the said wheel.

Second, The attachment rigidly to the loose feed wheel shaft of a lever b', or its equivalent, so operated by a cam G, or its equivalent, that when the loose clamping collar E, or its equivalent, is allowed to return after having given motion to the shaft and feed wheel together, the shaft is temporarily prevented returning with the clamping collar, or equivalent, and thus the friction between the wheel and the fast flanch or projection which the wheel has been clamped by the clamping collar, and is made to aid in preventing the return of the wheels with the loose clamping collar, or its equivalent, substantially as set forth.

[This relates, as is apparent, to the rotary or wheel feed alone. It is a very simple and effective means of producing and controlling the movement.]

MARINE CAMELS—Thomas Bell, of New York City. Patented in England April 16, 1856: I do not claim broadly the use of camels for raising sunken vessels, irrespective of the peculiar construction shown and described.

But I claim the arrangement of camels described, whereby great strength is secured to support a vessel while being raised and transported, and whereby the vessel will be lifted principally by the bow and stern, or where the greatest strength exists, and only partially fore and aft, or where the least strength exists, and whereby all the inconveniencies attending the application and use of those devices which require that some of their parts shall be passed under the keel or over or through the vessel are avoided, and other numerous benefits secured, substantially as set forth.

[Mr B. has been for the last ten years engaged in the business of raising sunken and stranded vessels. These improved camels are durable, and sufficiently strong to bear all the rough usages of the sea, and should the wind be strong, or ice collect so as to endanger the vessel after she has been raised to the surface, by simply letting water into the camels, the vessel can be lowered again to the bottom, beyond the reach of their destructive influence. The vessel can enter a dry dock with these camels on, and can be righted up so as to stand on an even keel, or be elevated at one end and lowered at the other, at pleasure, by simply drawing off or letting the water into the camels. The camels are cheap, not liable to derangement, and with one on the bow and another on the stem, a vessel can be raised in a few days at an expense of a few hundred dollars, whereas, without them, some months and several thousand dollars would be necessary to accomplish the same results.]

MACHINE FOR PLANTING POTATOES—Gatusha J. Bundy, of Lynden, Vt: I claim the arrangement of the two movable gates a and L, with the slider, the seed and fertilizer hoppers and their discharging holes or chambers, the whole being substantially as set forth.

MACHINES FOR MANUFACTURING FELT CLOTH—Thomas B. Butler, of Norwalk, Conn.: I do not claim the trailing of the fibers of wool upon the bat apron diagonally, by means of a traversing roll, for that is covered by the patent issued to John H. Bloodgood.

But I claim the traversing of the bat apron H, by traversing the apron drum D, independently, and in connection with a traverse of the frame, substantially as described and for the purpose set forth.

I also claim the traverse of the apron H, as described, in combination with a simultaneous opposite traverse of the transfer roll B, as specified.

SAWING MILL—Wm. M. Ferry, Jr., of Ferrysburg, Mich.: I claim first, Arranging the saw arbor and all the parts bearing a close relation to the saw on a metal yoke K, and making said yoke capable of being adjusted so as to stand slightly out of parallel with the edge of the carriage, substantially as and for the purpose set forth.

Second, I claim constructing the saw spindle J, with circular flanch j, and the common saw collar h, which surrounds the eye of the saw with a T-shaped socket i, of greater length than the flanch, so that the saw may have slight end play, independent of bearings, spindle or gearing, substantially as set forth.

Third, The application, in the manner described, of the adjustable self-fastening trip 2, to a saw mill, which operates with a continuous rapid motion back and forth, for operation in combination with the vibrating reversing stop w 2, substantially as and for the purpose set forth.

MAKING ACID SULPHITE OF LIME—Laurent Gamotis and Sabin Martin, of New Orleans, La.: We claim the process of making bi-sulphite of lime by means of furnace J, and cisterns h h h k, operated as set forth.

ROTATING HARROWS—James B. Glascock, of Fancy Creek, Ill.: I am aware that a patent has been granted for combining a weighted lateral arm with the draft bar of a rotating harrow, for the purpose of causing the harrow to have a positive rotary movement when it is drawn forwards.

I claim causing the after end of the pivoted draft bar to bear upon the upper surface of the rotating tooth frame, in such a manner as to properly distribute the propelling power exerted upon said draft bar, by which I relieve the fulcrum journal from injurious warping strains, and at the same time impart a steady and uniform movement to said tooth frame as it is drawn forwards, substantially as set forth.

CORN HARVESTERS—G. D. Haworth, of Mechanicsburg, Ill.: I claim the cutters I I, attached to suspended rods J, the cutters being curved and working underneath stationary teeth or fingers, substantially as described for the purpose specified.

[This ingenious device employs peculiar and effective means both for cutting the stalks and for discharging them in sheaves or gavels.]

FEED ROLLERS OF PLANING MACHINES, &C.—Jonathan Hall, of Worcester, Mass.: I do not claim generally the adjustability of feed and other rollers, or accomplishing this without any change of gearing, as these ends are gained by other methods now known.

But I claim the application and use of internal gearing H H, substantially as described.

I also claim in combination therewith the arrangement of the movable box R, and connecting bridle L, or their equivalents, for the purposes set forth.

REGULATING THE FIRE OF COAL-BURNING LOCOMOTIVES—John M. Hartnett, of Waukegan, Ill.: I claim the fan F, placed within the box G, connected with the pipes I H M M and J K, provided with valves and arranged substantially as shown for the purpose set forth.

[The fan is located at any convenient point and provided with pipes valved in such manner that the draft may be quickened or suppressed at pleasure, or if desired a reverse draft may be produced through the tubes, so that cold air may be drawn down to cool the boiler and prevent the generation and waste of steam in descending inclines.]

TENSION APPARATUS FOR SEWING MACHINES—Abraham Hoagland, of Jersey City, N. J.: I claim the use of two elastic wheels or rollers—governed by the saddle and thumb screw—between and around which the thread is passed, to give it any required tension in sewing with a machine constructed and operated substantially as described.

SIGNAL OR ALARM BELLS—George H. Hoagland, of Port Jervis, N. Y.: I claim the use of the cam reel D E, constructed and operated as described, or in any equivalent way, for the purpose of striking the bell for a signal, or ringing continuously for alarm, substantially as described.

I also claim the combination of the said reel with the hammer and belt, for the purposes set forth.

SHOVEL HANDLES—Geo. C. Howard, of Hardwich, Mass.: I claim my improved manufacture of shovel handles, as made with a split and bent stock and a round holder, applied and fixed together by concavities in the ends of the holder, convexities on the arms of the eye, and a rod and metallic caps, arranged and fixed together as specified.

METALLIC BRIDGE FOR PIANOFORTES—G. Henry Hulskamp, of Troy, N. Y.: I claim first, The sounding-board bridge, cast of metal with two bearings above the string, one on each side of the bottom support, substantially as and for the purposes specified.

Second, I claim the rod or wire K, or its equivalent, inserted in the bridge to form its bearing surface, for the uses and purposes set forth.

Third, I claim the construction and arrangement of the cast metal bridge i i, in such form that it may be detached and yet firmly held in its place in the mode set forth, or other form, substantially the same.

HOG TROUGHS—Elmore Johnson, of Winchester, Mass.: I claim an elongated trough or bowl and a quadrantal cover arranged or applied together and in an opening in a frame, wall, or the side of a pen or sty, and made to operate substantially as specified.

SAWING MILL—Franklin B. Kendall, of Bath, Me.: I do not claim any of the several separate devices or their secondary combinations.

But I claim the general arrangement thereof, for the purposes shown and described.

CORN PLANTERS—Norman A. Lewis, of Glenn's Falls, N. Y.: I do not claim distributing the corn or seed through hollow arms or through spouts placed radially in the driving wheel, so that the corn or seed will be deposited in the soil from the periphery of the driving wheel, for this has been previously done.

I claim having the slides i, placed over the ends or orifices of the conveying tubes h, the slides being attached to the ends of the same rod j, and operating said rod by means of the curved incline o, attached to the rod or bar D, and the pulley or roller attached to the rod j, the whole being arranged as shown, whereby the slides are actuated or opened and closed alternately, for the purpose set forth.

I further claim the hoe, H, attached to the frame G, which is placed within the roller frame F, arranged as shown and operated by the projections q, on the driving wheel B, for the purpose specified.

[This machine, as implied in the claim, may be moved by either man or animal power, and plants by the revolutions of the wheel with great regularity. The hoe referred to is for the purpose of covering the grains.]

BAGASSE FURNACES—George M. Longacre, of New Orleans, La.: I claim the construction of bagasse furnaces with a space c, around and communicating with the upper portion of the fuel chamber, substantially as described, and leading to an exit flue F, regulated by a damper, when said parts are additional to the ordinary channels for the passage of the products of combustion, the operation being substantially as and for the purposes specified.

HAND WRENCH—G. B. Phillips, of Albany, N. Y.: I claim in combination with the jaws, the arrangement described for regulating the space between the jaws and securing them when so adjusted, that is to say, by the employment of the toothed blocks operated alternately upon teeth in the upper jaw by the spring and saddle or their equivalents, so as to regulate the space to distances differing by half the spaces between the teeth, substantially as set forth in the specification.

RAILROAD CAR COUPLING—Wellington Prosser, of Kendall, N. Y.: I claim the combination of the jaws, j j, hoop or band, B, and link or shackle bar, H, the whole being constructed and operated substantially as described.

It being understood that I do not claim the combination of the jaws, j j, with the link, H, alone, but the combination of these elements with the band, B.

METHOD OF TURNING CARRIAGE HUBS—Alexander Rickart, of Schoharie, N. Y.: I do not claim separately the rotating cutter head,

But I claim the frame, H, placed on the driving or power shaft, D, and connected with the mandrel, G, by the arms, m m, the frame H being provided with the gearing, as shown, to connect the shaft, D, with the mandrel G, which mandrel is placed on the sliding carriage, E, when the above parts are used in connection with the rotating cutter head, C, the whole being arranged substantially as and for the purpose set forth.

[In this invention the gearing by which power is communicated from the driving or power shaft to the mandrel which carries the "stuff," is fitted in a vibrating frame, the lower end of which is allowed to move freely on the driving shaft, so that the stuff and the cutter head may both be worked by the same driving shaft, and the stuff fed to the cutter head without interfering with the gearing.]

GOVERNOR—Nathan Scholfield, of Norwich, Conn.: I claim the application of a compensating adjustment for so changing the normal or medium rate of action of a governor or regulator while in action to rectify a disturbed motion, that it shall cease to act on the supply of the motive power while the speed of the wheel or machinery is returning from any extreme of variation, and before reaching its proper rate or that in which its action commenced, and also that it may commence a reverse action thereon, to counteract or anticipate any excess thereof, if the return of the speed is so rapid as to induce a tendency to pass its proper medium.

GARDEN HOES—Solomon Shutter, of Allegheny, Pa.: I do not claim the mere form of the tines or prongs on the top of the hoe blade, that is to say, said tines being formed concave on the back, and convex on the face.

But I claim cutting and forming hoe blades out of sheet iron or steel with side edges, A, and prongs C, as described, and for the purpose set forth.

COTTON AND CANE CULTIVATORS—T. E. Shannon, of Woodville, Miss.: I claim the combination with a wheel carriage of a series or gang of revolving cultivators, arranged and operated in the manner and for the purpose set forth.

STRAW CUTTERS—J. L. Sullivan, of Lexington, N. C.: I claim the two sets of knives, G, b, and slotted plate a, combined and arranged so as to operate conjointly as shown, for the purpose set forth.

[In this invention two sets of rotating knives are so arranged that their planes of rotation are at right angles to each other, an arrangement which ensures the perfect cutting of hay or straw, however much it may be tangled.]

ROOFING COMPOSITIONS—J. B. Wands, of Chicago, Ill.: I claim the combination of the various ingredients on the proportions before set forth.

STOPPING SHOT HOLES IN VESSELS—John Woodville, of Chillicothe, O: I claim, first, The arrangement of the disk, A, formed of india rubber, and whalebone slats, a, the rigid bar, B, the jointed rod, D, the chains or cords, c c, and the spring C, relatively to one another, in the manner substantially as and for the purpose set forth.

Second, The arrangement on the bar, D, of the slide, E, the tubular rod, E, the slide, G, with catch f, the rod m, and the straps, h, relatively to one another, and to the disk and its attachments, substantially as and for the purposes set forth.

[An elastic pad or disk of a strength sufficient to resist the pressure of water is so mounted on a rod that it may be forced outward from the interior of the vessel, and allowed to expand and cover the whole tightly on the outside.]

GRAIN SEPARATORS—Wm. Zimmerman, of Quincy, Ill.: I claim the perforated rotating disk, P, with its diamond-shaped ring or its equivalent on the same shaft with the fan, arranged and operated so as to throw the grain by centrifugal force into the blast pipe horizontally substantially as described.

I claim the cheat box, W, around the suction pipe, in combination with the tunnel-shaped delivering tube, X, and spreader, Y, arranged substantially as described, so as to make the grain descend through the blast of air and through a tunnel-shaped pipe over the spreader, substantially as and for the purpose specified.

I claim a conical plug, arranged so that it can be adjusted in the suction pipe, substantially as described, to graduate the flow of the blast in the suction pipe, and regulate it as desired.

RETORT COVERS—J. R. Floyd (assignor to T. C. Kibbe) of New York City: I claim constructing gas retort covers of malleable iron, in the manner and for the purposes set forth.

RENDERING JOINTS STEAM TIGHT—Wm. S. Gale (assignor to Peter Poillon) of New York City: I wish it to be understood that I do not claim the grooved surfaces in themselves, as these have before been used for other purposes, and have been used in connection with air engines.

I claim the method described of causing steam to become a packing to itself in steam cylinders, or other parts of steam machinery by allowing the steam to act in one or more grooves, substantially as specified.

MACHINES FOR DIGGING POTATOES—Jos. Heulings (assignor to W. H. Lawson, B. M. Heulings, and Jos. Heulings) of Philadelphia Pa.: I claim the combination of the rotary digger oscillating frame and oblique stalk cutter, connected and operating substantially as specified for the purpose set forth.

DIAPER PINS—J. Heilmann (assignor to Ignatius Sturn) of New York City: I claim the tube, A, having the slide B fitted within it, the slide being attached to one end of tube A, by a spring b, formed of india rubber or other suitable material, and the hook C attached to the slide B, the tube A being slotted longitudinally, and the parts arranged substantially for the purpose set forth.

[A steel hook is attached to a slide fitted within a slotted tube. The spring attached has a tendency to keep the point of the hook within the tube. By shoving the hook out beyond the end of the tube, passing it through the parts to be held together, and then allowing it again to pass into the slotted tube, the hook is securely prevented from slipping out.]

PHOTOGRAPHY—H. A. Marchant (assignor to E. D. Marchant) of Philadelphia, Pa.: I claim rendering the picture transparent, and attaching the same to glass in a permanent and secure manner, by means of a mixture substantially such as described above, applied under heat and pressure, in the manner and for the purpose above mentioned.

SPARK ARRESTERS—J. F. Page (assignor to himself and James Landy) of Philadelphia, Pa.: I do not claim the arranging of a series of screens above, and so as to overlap one another, as in the spark arrester patented by Geo. Holbrook, 1855.

Neither do I claim the use of two drums placed one above the other, and each furnished with a screen, as in the spark arrester of Joannes Oberhauser.

But I claim the arrangement of parts relatively to one another, as specified, so as to effectually arrest the sparks of a locomotive without obstructing the draft, as set forth.

[In this arrester, the inside chimney is provided with liberal openings in its sides, and with annular plates and wire screens suspended at different levels within, which deflect the sparks outwards into the space between the exterior and interior chimney, whence they fall into the "sub-treasury." The smoke is intended to rise nearly unobstructed.]

CYLINDRICAL DOOR BOLTS—C. G. Page, of Washington, D. C.: I claim the oblique slot in the guard in combination with the lever or handle of the bolt working in said slot as set forth.

I also claim the zig-zag return slots, S, in the guard as shown in fig. 2, by which the bolt is carried through its range by the two movements of raising and depressing the handle as set forth.

ADDITIONAL IMPROVEMENTS.

MACHINES FOR KNEADING DOUGH—J. L. Rolland, of Paris, France. Patented Jan. 9, 1855: I claim so forming the kneading wings that they shall in their revolution present alternate concave and convex surfaces to the dough substantially as and for the purpose specified; and this I claim whether these concave and convex surfaces are obtained by revolving blades alone, or by a revolving blade or blades in connection with a pressing roller as set forth.

DESIGNS.

IRON RAILINGS—Henry Jenkins, of Brooklyn, N. Y., assignor to the New York Wire Railing Company.

MEDALLIONS OF FRANKLIN TO MARK PENS AND PEN HOLDERS—Wm. Ball, of New York City.

Chinese Sugar Cane.

It appears that it is not yet fully settled whether the much praised and also much abused millet produces crystalizable sugar, and that *cane* sugar, or only a solution of grape sugar, forming a kind of syrup—the form in which it has invariably been exhibited to us.

Dr. Charles T. Jackson, who is experimenting under the employ of the government, writes to the Patent Office that he had put Mr. Wray's crystalized sugar, and a lot of his own obtained from Mr. Wainwright's plants, into the hands of the microscopic department of the Boston Society of Natural History, and that a report would soon be made on the nature of this sugar. Dr. Jackson looked with a microscope at the crystals, which were rhombic prisms, or of the cane sugar type, which is contrary to the opinion expressed by Dr. A. A. Hays, who contends that they are nothing but grape sugar, which occurs in cubes, and not in rhombic prisms.

Water-Proof Glue.

Jeffries' Marine Glue is prepared by a firm in Great Britain as an article of commerce, and is used to a considerable extent in that country, even in gluing together the parts of large masts; but although various methods are popularly believed to render common glue water-proof, we believe they are never practiced to any considerable extent in this country. One of the apparently easiest of these processes for rendering glue insoluble is to dissolve it in linseed oil instead of water, and then use it in the ordinary manner; but so far as our observation has extended, there is great difficulty in inducing glue to dissolve perfectly in oil by any ordinary means. Another method which we have before published as well adapted to fixing together portions of patterns for foundry purposes and the like uses, where a moderate degree of moisture is to be encountered, consists in dissolving india rubber in naphtha or oil of tar, using enough of the latter to make a thin varnish, to which is added a little shellac, and the whole allowed to macerate for about ten days. After this, more shellac is added, enough to make it pretty stiff, when it is heated and poured out into plates. It must be heated to about 250° when applied, a little above any heat which can be obtained in the ordinary glue pot.

A recently invented and easily prepared material, said to possess the desired properties in a very high degree, is known as Vernon Bell & Co.'s discovery. The recipes as sold by the proprietors describes the process of manufacture as follows:—

Dissolve one-fourth lb. common glue in water the usual way; then dip into it some clean white paper sufficient to take it all up. When the paper is nearly dry, cut it into strips and put them into a common glue pot; add one lb. alcohol, and boil gently for one hour. Then take out the paper—the only use of which is to give the glue more surface for the action of the alcohol—and add one-fourth lb. powdered gum shellac; continue the heat, gently stir the mixture until the shellac is dissolved, and then evaporate it to the proper consistence for use. For cement add more shellac and prepare it thicker.

Origin of Frangipanni.

There is in Rome a family bearing the patronymic of Frangipanni, as famous in Italy as the Plantagenets and the Tudors in England. The origin of the name of this family is traced to a certain office which an ancestor filled in the Church—that of supplying the holy bread, the wafer, in one of the ceremonials. Frangipanni literally means "broken bread," and is derived from *frangi*, to break, and *panus*, bread. Hence we have the Frangipanni puddings, which good housewives know are made with the broken bread. One Mercutio Frangipanni, who lived in 1493, was a famous botanist and traveler, noted as being one of the Columbus expedition when it visited the West India Islands. The sailors, as they approached Antigua, discovered a delicious fragrance in the air; this Mercutio told them must be derived from sweet-smelling flowers. On landing, they found vast quantities of the *Plumeria Alba* in full bloom, rendering the air redolent with rich odor; and from this plant, which the present inhabitants of Antigua call the Frangipanni flower, is distilled that exquisite fragrance which is now so popular in fashionable circles. SEPTIMUS PIESSE.

The Asteroids.

There is a tolerably regular law which proportions the varying distances of the planets from the sun, with one exception, and that is between the orbit of Mars and that of Jupiter. To make this law or ratio hold good throughout the whole solar system, there should be one planet traveling around in a certain path between these, instead of which there are a number of small planets, termed asteroids, moving all somewhat irregularly, but pretty nearly in the path which the single planet should. Our school books taught us there were four of these bodies; but subsequent researches with powerful telescopes have discovered more, until a few weeks since the fourty-fourth was discovered.

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The True Source of Information.

MESSRS. EDITORS—I was very much pleased with an editorial article published a few weeks since on inserting teeth on plate. In my opinion your remarks were most valuable, and must have been very useful to the person who sought your advice. If every reader would but subscribe for the SCIENTIFIC AMERICAN, they would save more than ten times the cost of a year's subscription, in avoiding the impositions of mountebanks in my profession alone, to say nothing of quackery in general. Truly I believe that your paper is invaluable to all.

I shall be glad, by your permission, to send you a short article upon dentistry, which may contain some valuable hints to your readers.

A. S——., M. D.

Salmon Falls, N. H., July, 1857.

The columns of the SCIENTIFIC AMERICAN are at all times open to contributions from practical men upon the various industrial interests of the country. We invite such communications, and we only reserve to ourselves the right to amend or reject them entirely, if, in our judgment, the interests of our readers will be promoted thereby.

When we assumed the management of this paper in 1846, we determined to make it a sound and reliable medium for the propagation of useful information. How far we have succeeded in our endeavors, we must leave the public to decide. The SCIENTIFIC AMERICAN is the only journal of the kind in this country which has met with any success; and since its commencement, we feel safe in asserting that at least twenty pretended rivals have been brought into existence, and expired after the issue of a few numbers. Our circulation has steadily increased from the beginning up to the present time, and we shall enter upon a new volume on the 12th of September next, when we hope to receive the same encouragement which has been so liberally extended to us during the past twelve years.

We intend that the contents of our columns shall be perfectly reliable, so that our readers may know what to depend upon. If we stumble upon Hot Air or Static Pressure Engines, Paine's Gas, Fire Annihilators, or any other discoveries or inventions of doubtful utility, we shall, as heretofore, deal with them as they deserve, and invariably give scientific reasons for our position.

Chromotype Copies of Plants, Leaves, Prints, Engravings, &c.

MESSRS. EDITORS—Thinking that the following instructions for taking copies of plants, leaves, prints and engravings, may prove interesting to many readers, I take the liberty of forwarding the present for insertion, should you consider it worth the trouble.

First wash some good writing paper, or, what is better, white foolscap, with solution No. 1. When dry, place the plant, leaf or engraving on the same, and cover it with a piece of clean glass—clear window glass of medium thickness will answer. Expose it in the sun for ten or fifteen minutes, and then wash it over, *in the dark*, with solution No. 2. When well dried wash it over again with distilled or pure rain water, and it is then finished. After washing it with the nitrate of silver solution a vivid picture will make its appearance, a perfect copy of the original. By washing it again in water, the nitrate of silver is carried away, which, by remaining would spoil the picture, as it is only required to bring out the *clare-obscure*, and "fix" it. After the paper has been exposed in the sun, care must be taken to wash it with the nitrate solution in the dark, as the light affects it. It is advisable to use camels' hair brushes for the washing part, especially with solution No. 2, as it burns and blackens the skin or anything in the shape of clothes it falls on. The cost of having these recipes prepared would amount to about twenty-five cents, and would suffice for quite a large number of pictures. Success will be more certain if the paper is washed over at least twice with solution No. 1.

Solution No. 1 —Bi-chromate of potash, ten grains; sulphate of copper, twenty grains; distilled water, one ounce.

Solution No. 2.—Five grains of nitrate of silver dissolved in half an ounce of pure distilled water. GEO. W. BANCROFT.

Providence, R. I., July, 1857.

A Question about Patents.

MESSRS. EDITORS—It seems to be a disputed point here with a great many persons, whether or not a patent for an invention prevents a man from imitating it for his own private use, as long as he does not sell it; or, is it not the object of the law to protect the patentee from competition in the sale of his invention? I have been requested by many citizens of this place to write you on the above. W. H. D.

Madison, Fla., July, 1857.

[A patent is a monopoly. It grants to the patentee for a term of fourteen years the right to *make*, vend and use, and to sell to others the same rights and privileges for the term specified; therefore no one has any right whatever to make or use a machine on his individual account without liability to the patentee, any more than he has to enter into the manufacture as a regular business. There are large numbers of patents which would be of no value were the reverse established; such as patents on bridges, which railroad or other companies could build quite as well as the inventor, and patent rigging, which ship-owners might, and do, construct on their own account, and the whole catalogue of important manufacturing processes. There seems to be with many, a feeling that individuals may construct and use a patented machine on his own premises, with impunity; but it is as distinctly an infringement as any other way of defrauding the inventor.

Labeling of Inventions.

MESSRS. EDITORS—Will you be so kind as to favor me with an answer to the following query:—Smith, prior to obtaining Letters Patent on an invention, assigns his interest in full to Brown, and the patent is issued to said Brown. Now in stamping the article patented should it be Smith's or Brown's patent? By doing this service you will very much oblige one of your numerous subscribers.

Watertown, Conn., July, 1857. S. B. G.

[It will be very proper to stamp the machines with the name of the assignee, as, for instance, "Brown's patent, July 4, 1857." There are many inventions thus marked; but it is not necessary that either name should be prefixed.

Submarine Carriage Ways.

MESSRS. EDITORS—In No. 39, this volume, SCIENTIFIC AMERICAN, I see an article relative to a new project or design, under the head of "Holcomb's Submarine Carriage Way." I am fully convinced of its practicability, and several years ago gave the subject some attention, having been attracted to the project by a notice in the *Engineer Journal of Vienna*, in the spring of 1852. The notice is as follows:—

"The project for a railway across the channel between France and England is strongly agitating the minds of many eminent engineers. One of the last and most practical is from a French architect, M. Horeau. He proposes an iron cylinder or tunnel, constructed similarly to the great Britannia Bridge. To a cylindrical tube he gives the preference, the same to be large enough for two tracks to be laid on the bed of the sea, and to be supported and fastened at intervals of about one mile by pyramids also of iron, to reach above the surface of the sea, to be lighted by night, and to be at all times a beacon for sailing vessels. These beacons are intended also to prevent anchorage in the neighborhood of the tube, the length of which will be nearly twenty-one miles.

It is stated that an English engineer, Mr. Hughes, of Rochester, has made some experiments as to the practicability of the project, and has found that there would be no obstacle to its execution. After Horeau's calculation, the cost would amount to nearly £14,000,000 sterling."

From this, Messrs. Editors, you will see that the project is not altogether original with either of your late contributors.

FELICIAN SLATAPER, Civil Engineer.

Pittsburg, July, 1857.

Turpentine on Gunpowder.

MESSRS. EDITORS—You state on the authority of Dr. Reid, in your issue of the 20th of June, that gunpowder will not explode or burn when spirits of turpentine is burned in contact with it, because the powder acts as a candle wick. This is not a *strictly philosophical* explanation of the phenomenon, as may be shown by burning spirits of turpentine or alcohol from gunpowder placed on the bottom of an inverted saucer. A little of either of these liquids will burn off without igniting the gunpowder; but, if you pour on enough to heat the porcelain to a certain temperature, the gunpowder will explode. So, then, it is not for the want of oxygen (of which it has a sufficiency in itself) that the gunpowder does not readily explode in flame, but for the want of caloric.

In the case of the candle wick, there is not so much a want of caloric as of oxygen which is consumed in transforming the hydro-carbonaceous gases around it. In short, there are two necessary conditions to the combustion of candle wicks, the presence of oxygen and caloric; but only the latter alone to the combustion of gunpowder. RUSTICUS.

Gay Hill, Texas, July, 1857.

Muscles and Pearls.

Pearl-fishing in New Jersey has been about exhausted, but the rage for the treasures has extended to several distant points. A few pearl-producing muscles have been found in the streams of Marlborough, Mass., which connoisseurs pronounce of the first water, and a joint stock company of pearl fishers is talked of, to purchase lands adjacent to their jeweled streams, and obtain exclusive rights over them. They expect to encourage the growth of pearl-bearing muscles, as gardeners entice their vines into grape or melon bearing.

A gentleman of Pawtucket, R. I., has exhibited to the editor of the Providence *Journal* some pearls which he collected from muscles in the streams in that vicinity. They were mostly small. One very large one was of such irregular shape as to be of little value.

Newspapers in Maine represent that considerable excitement prevails in Warren and Thomaston, near the mouth of the Penobscot, with regard to recent discoveries of pearls in some of the streams flowing into Oyster river. One gentleman obtained two hundred of various sizes, one of which was about the size of an ordinary pea, and another about three hundred. Many persons are engaged in the search for the valuables.

It is estimated by one authority that the whole value of all the pearls yet found in our waters is not over $12,000. The number of men employed in the search is probably still less definite, but it has probably paid at the rate of from one to ten cents per day. Whether or not it has proved profitable to any individuals, it has resulted in the almost total destruction of the shellfish. One man affirms that he opened two thousand with his own hands without finding a pearl.

Vinegar.

The juice of one bushel of sugar beets, worth twenty-five cents, and which any farmer can raise with little cost, will make from five to six gallons of vinegar equal to the best elder wine. First wash and grate the beets, and express the juice in a cheese press, or in any other way which a little ingenuity can suggest, and put the liquor into a barrel, cover the bung with gauze and set it in the sun, and in fifteen or twenty days it will be fit for use. By this method the very best of vinegar may be obtained without any great trouble, and I hope all who like good vinegar will try it.—*Ohio Valley Farmer*.

A Fat Salary.

Mr. Moran, the new President of the New York and Erie Railroad, combining, to a great extent, the duties of President and General Superintendent, is to receive a salary of $25,000 per annum.

Five thousand pounds sterling have been granted by the British Government to Captain Boxer, of the Royal Artillery, and Superintendent of the Woolwich arsenal laboratory, as a reward for his invention and improvement of fuses and shells, which ware used at the seige of Sebastopol.

Danger of Heating Furnaces.

The Fire Marshal of New York, in his annual report, just made, calls attention to the frequency of fires from the ill construction of buildings with regard to heating. Sometimes the builder is not in fault, but the occupant of a building constructed without reference to the hot air furnace, will have one at all risks. The furnace builder accordingly erects one or more, according to the size of the building, and has no other alternative than to insert the furnace smoke-pipe into the flue already found in the premises. The trimming of the floors is extended directly against the flues, leaving only about four inches of mason work to protect the wood. The intense heat generated within so small a compass soon begins to exhibit itself in the charring of the wood-work, and, after a brief interval, combustion is liable to take place at any moment. An extra tier of brick-work, carried up outside the flue, leaving a space of several inches between the outer side of the flue and the new mason work, so that a current of air is always passing between the flue and the outer casing, would prevent such accidents.

Source of Fat.

During the course of the past year, experiments have been made in France on a number of ducks to prove that the fat may exceed the the quantity which could be referred to the food they were supplied with. Some were fed on rice, a substance which contains only a few parts of fat in a thousand. Others fed on rice with a certain amount of butter added. At the end of the experiment, the first were as lean as when first placed upon the diet; the latter, in a few days, became positively balls of fat. Other experiments were made on pigs. It was found as the result of several trials, that there was sometimes more fat produced than was contained in the food on which they were fed. Food which, given alone, has not the properties of fattening, when mixed with a fatty matter acquires the property to an astonishing degree; and fattening articles of food, which do not contain much fat, always abound with its chemical constituents, the principal of which is azote, and from whence the fat acquired is certainly derived.

Niagara Suspension Bridge.

A tubular bridge is talked of, to connect the United States with the Canadas, and to take the place of the suspension bridge, the dimensions to be as follows:—Length of bridge, 840 feet; hight of piers above water, 225 feet, with a double railway track, carriage ways, etc. The reason given for this project is the familiar one, that suspension bridges are liable to failure. It is averred that the suspension bridge at Niagara Falls is not to be a permanent structure, that chain bridges cannot be depended upon for a longer period than seven years, the action of the weather and the wear and tear to which they are exposed rendering them dangerous after that time. We find the paragraph in our exchanges, and give it without endorsing its accuracy.

Freight Wagons.

At Stockton, Cal., wagons are built to run between that place and the mines, the iron work of which is of the best Norway metal, and polished like the work of a fire engine. These structures are capable of transporting immense burdens over the rough roads of that region. A load of between seven and eight tuns was recently carried in one of them from Stockton to Mariposa; another of barley, weighing nineteen thousand six hundred pounds, was brought into Stockton; and a third, of goods to the mines, weighing eighteen thousand one hundred and sixty pounds.

It is stated in an exchange that a bark of 390 tuns burthen, named the *C. J. Kershaw*, capable of taking 16,000 bushels of grain, and intended as the first of a line to run from Chicago to Liverpool, was launched at Chicago on July 4th.

A recent work on bread says that every woman in the county of Suffolk, in England, knows how to make bread, and that in the town of Bury, with 60.000 inhabitants, there are only two public bakers.

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New Inventions.

Straw Paper.

Three different newspapers of Cincinnati have been using paper manufactured by Martin Nixon, after a process of his own invention, in which there was 75 per cent of straw, and they speak highly of its qualities as adapted to newspaper purposes. It is well known that straw can be partially bleached and used as an ingredient in papermaking, but the economy of the material and process is most questionable.

New Churn and Butter Worker.

The already quite popular churn represented in the accompanying figures is the invention of Franklin Thorpe, of Springfield, Ill., and was patented September 23, 1856. It is a rotary churn, so arranged that by a very simple and almost self-acting change imparted to the dashers or wings, it is capable both of churning very efficiently when turned in one direction, and of gathering and working the butter when turned moderately the opposite way.

The general exterior is similar to ordinary rotary churns, and is shown in Fig. 1 with the cover removed. Fig. 2 shows, in perspective, two parts of the wings or dashers, with the crank and a portion of the shaft removed. Fig. 3 represents elevations of the wings or dashers. The same letters refer to like parts in all the drawings.

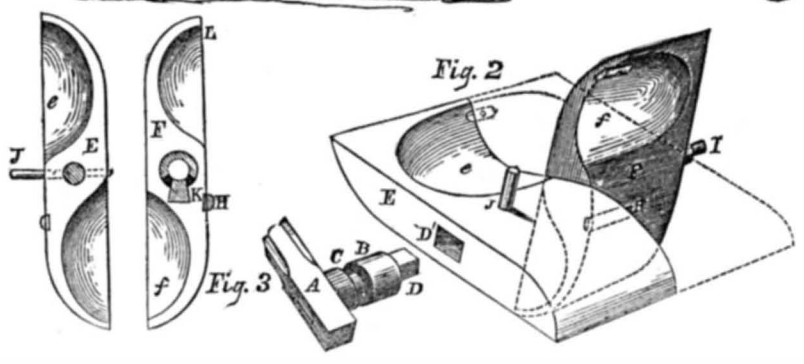
A is the crank lever; B is a portion of the shaft attached firmly thereto, and C is a deep groove therein, in which fits the stop M, to retain B in place. D is a square tenon on the end of the shaft, B, which fits into a corresponding mortise, D′, to give motion to the revolving wing, E, which, in turn, moves the other wing, F. Both wings are hollowed out, as represented at *e f*, so that when revolved in the proper direction they seize the cream, and throw it with considerable force against the side of the churn; but when revolved in the opposite direction, the rounded ends of the wings act in a much gentler manner, and tend to compress and roll the butter between themselves and the bottom and sides of the churn. The better to facilitate the operations both of churning and gathering, the wing F is made capable of performing a quarter revolution independent of E. This novel arrangement is secured in the device represented, by the insertion in E of a suitable shaft, I, which is retained by the transverse pin, J. The further extremity of I is turned smaller, to form a suitable bearing in the end of the churn, so that the two wings, E and F, taken together, are supported in an axis which is not single and continuous, but made up of two parts both fast in F—one of which is D on the crank shaft, and the other the part I, as described. There is this difference in the arrangement of the two wings, E and F, however, that while E is rigidly secured to B, and compelled to rotate therewith, the wing F is mounted loosely on I, and free to revolve to a certain extent, about one quarter of a revolution, by a simple device which is distinctly shown in Fig. 3. It consists simply in cutting out a portion of the material of I, and allowing the key, K, fast on F, to project into the cavity thus formed. The key, K, is considerably smaller than the cavity, and consequently allows considerable play.

L is a stop secured on the face of F, and overhanging toward E. When the churn is rotated in one direction, the wing F is turned by the resistance of the cream until the stop L meets the face of E, as shown by the dotted lines in Fig. 2. E and F then, revolve together, and the scoop-like cavities, *e* and *f*, by coinciding each with the other, contribute to a very efficient action as a churn. The stop, H, on the wing F may either be allowed to project like L, and thus form a contact to aid L in connecting the two wings; or it may be made to act as a bolt, by being moved by the hand in a dove-tailed groove, so as to act or not, as desired, or it may be dispensed with altogether, without interfering with the effect, so long as the other stop, L, is uninjured.

In agitating the cream, this churn seizes and dashes it violently against the sides, and the two parts, E and F, by their positions, combine to form large hollow scoops, which act in this manner very efficiently. When the operation is completed, and the butter has "come," the crank, as above described, is rotated moderately in the opposite direction, and the particles are made to cohere. In this latter operation, it is desirable to divide and render gentle the action of the wings, E and F, to which end the voluntary partial revolution of F on the shaft I, as already provided for, conduces very greatly.

THORPE'S CHURN AND BUTTER WORKER.

Fig. 1

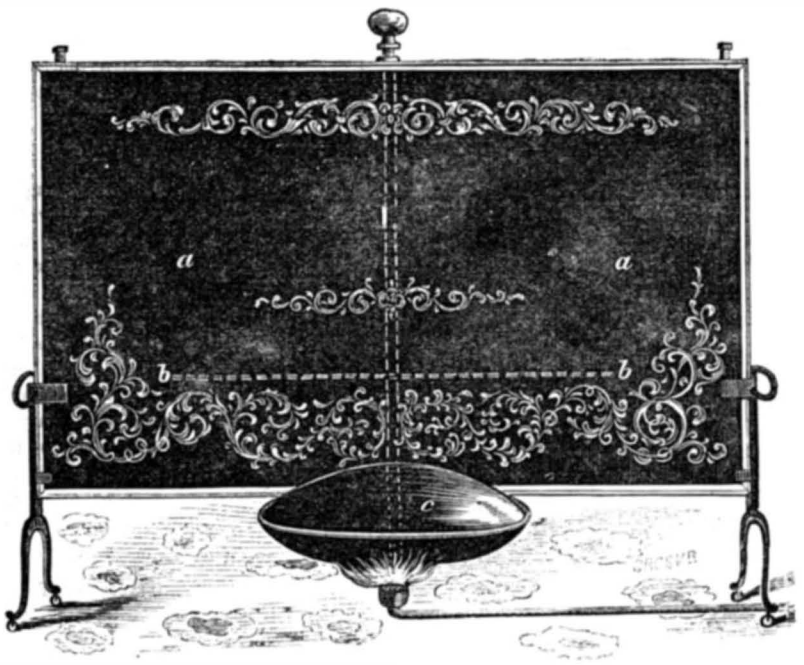


Figures 1 and 2 represent the parts in the position proper for gathering.

The cream should be at the temperature of 62 degrees in warm weather, and 65 in cold. Like other rotary churns it should not be filled much above the crank; a little below is better. The crank may be turned some 80 or 90 revolutions in a minute. When the butter is gathered, the milk is drawn off and water turned in, continuing the reverse motion until the milk is expelled. Then the salt is put in and worked in the same manner, (the operation of gathering and working should be performed with the lid off,) and the dasher is is then taken out to remove the butter.

For further information address the inventor, Franklin Thorpe, Springfield, Ill.

CHESTER'S RADIATOR.



The accompanying figure represents a very simple apparatus for heating one or more rooms by steam. The steam is generated in a very small boiler attached below, represented as being heated by a jet of gas from a suitable burner. The apparatus might, perhaps, be operated with tolerable effect on a large scale, and by the employment of coal, wood, peat, etc., for fuel, but is principally designed to serve in heating small rooms, where, as in many dwellings in cities and large villages, gas is readily obtained, but the magnitude or number of rooms to be heated will not justify the expense of a regular system of heating by steam supplied from the basement.

The radiator is composed simply of two thin plates, stamped or japanned with ornamental figures, and joined at the edges so as to present a broad surface some three or four feet square on each side but without occupying more than one inch of thickness. The boiler is soldered or otherwise attached at its base, and with its interior in free communication therewith. The radiator is represented by *a a*, and the boiler by C. The boiler is constructed almost as simply as the radiator, and is composed entirely of two circular plates of copper, or other suitable material each in a dishing or cup-like form, and soldered together at the edges. *b* is a horizontal partition, to compel the steam to diffuse itself better to all parts of the base before ascending to the top of *a*.

I is a vertical pipe extending from near the base of C to the top of *a*, where there is an ornamental funnel always open, to allow of water being supplied to the boiler. The parts are so proportioned that steam can never rise above a very moderate pressure, say one-half pound per square inch; but should it, by any possibility, chance to exceed this, water will flow over at the top of this pipe and relieve it. This relieves the apparatus from any necessity for a safety valve. When in ordinary use, the steam condenses on the interior of the radiator as it gives off its heat, and, of course, trickles back into the boiler; but in case, from gradual leakage or other cause, the water becomes too low in the boiler, so as to stand below the bottom of the tube, I—or below some small holes provided in I, near its base, for the purpose—steam will immediately issue from the funnel at the top, and give warning of the fact.

The whole apparatus is made very light and portable, and somewhat ornamental. It was patented June 30, 1857, by I H. Chester, of Cincinnati, O., to whom all further inquiries should be addressed.

The Great Eastern.

It appears from late accounts that the construction of this mammoth ship is still, to some extent, embarrassed by financial difficulties. At a semi-annual meeting of the owners in London, on July 1st, a statement of the progress of the vessel and the financial condition of the enterprise was offered, in which it was announced that the vessel was substantially completed as to her hull, and that no doubt existed that she might be successfully launched in the early part of September; that although the best time for making a trial trip to Portland would be in the month of October, the directors felt that it would be difficult, without adding largely to the cost, to complete the ship by that time, but that they had no doubt she could be completed and properly equipped by April of next year, the next most favorable season for the voyage; and that the total cost of the ship and engines would be about £620,000, on account of which there has already been expended £460,838, leaving a balance to be provided of £159,162. To meet this balance there are calls in arrear, estimated good, and cash in hand, amounting to £92,000, leaving a balance to be provided of about £67.162, to which, if £31 000 be added to cover all possible contingencies, the sum total to be raised will not be far from one hundred thousand pounds sterling. This sum it is proposed to raise by mortgages upon the ship.

Spots on the Sun.

According to the observations made by M. Rudolphe Wolf, Director of the Observatory at Berne, it appears that the number of spots on the sun have their maximum and minimum at the same time as the variations of the needle. It follows from this, that the cause of these two changes on the sun and on the earth must be the same, and consequently, from this discovery, it will be possible to solve several important problems, in connection with these well-known phenomena, the solution of which has hitherto never been attempted.

Texas Wool.

The editors of the New Orleans *Picayune* have been shown a lot of wool from the prairies in Texas, which is equal to the best imported Saxony. It is said that in a few years the "Star State" will furnish more wool than any of her sisters.

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Scientific American.

NEW YORK, AUGUST 1, 1857.

The Government Iron.

The United States of America possess a vast extent of territory, with great varieties of climate, soil and productions; but if there is any one element of natural wealth possessed by this nation more conspicuously apparent than another, it is her supplies of iron and of the materials for making the same available. We are full of iron ores, some of which are among the purest and most valuable in the world. Owing to the general prosperity of the country, and the consequent high price of labor combined with the want of capital, etc., we cannot produce iron as cheaply as the old established manufacturers of Great Britain; but the quality is far superior, and patriotism as well as policy induces the adoption of our iron by great numbers of American consumers, even though the price be somewhat higher. It may surprise some to know that in this condition of the business, while our iron makers are struggling for success in competing with English agencies, matching the superior quality of their metal against the ability of their long-winded antagonists to give immensely long credits, Uncle Sam himself, whose ability to pay is unlimited, and whose opportunities for "acquiring" *patriotic feelings* are certainly tolerable, stands in the market, by the present contract system, as a purchaser of English iron, and is repeatedly and dangerously "stuck" with the rotten stuff, as he ought to be. It is greatly to be deplored if no better system than the present one of contracting with the lowest bidder can be proposed. We are making iron all the way from the Allegheny to the Connecticut, and at a dozen places beyond these bounds, far superior to that imported, if we except the comparatively small quantities from the Baltic ports; and if the lowest bidder system is, as we believe, the strongest safeguard against corruption and favoritism in the government inspectors, it should be established as a rule that the bids should be for American metal unless the stiffer product of Swedish or Russian furnaces be better adapted to some especial purpose, and if so, this should be specified.

E. B. Ward, Esq., of Chicago, (whose enterprise and ability in establishing steamers upon the great lakes has done more to develope and improve the condition of our country than the united efforts of all the fogies now under pay of the government,) recently addressed a letter to Hon. Isaac Toucey, Secretary of the Navy, on the superiority of the Lake Superior iron, and inviting the attention of the department to its adaptability for naval purposes. He was most respectfully snubbed by a short and dignified note, simply informing him that the contracts for iron for the current year had been given out.

As an example of the results of this goutily managed business, we subjoin the following from an able notice of the performance of the steam frigate *Niagara* in the last number of the *Nautical Magazine*:—

"Captain Hudson used her canvass with caution, owing to defects in the iron work of the rigging, which proved to have been manufactured from material of very inferior quality. Justice to her lamented constructor, the late George Steers, requires that the source of misfortune in the iron work be pointed out, that the responsibility may be placed where it belongs. The iron was of worthless quality, and no blacksmith could make good work from it. On overlooking the last report of the Secretary of the Navy, we find that a party in this city, Messrs. Storer and Stephenson, furnished the supplies of metals for the Brooklyn Navy Yard during the period of the *Niagara's* construction. These supplies were furnished by contract on the *cheap* or *lowest bidder system*. The materials were accepted by the inspecting officer, and they were quite beyond the control of any naval constructor in the premises. Constructors at the navy yards have to use such materials as are furnished. Wooden materials are always more carefully inspected than metal, while cheating is more easily done in the latter."

If prudence dictates that the best and most reliable iron be employed even by private parties in the steam boilers for their manufactories, and in the cables by which their ships withstand the gales, shall our government take the most conspicuous place among the temporizers who care for nothing but first cost? Many speculative railroad managers are only anxious to get something which looks like iron into place, and sell out before its failure is discovered—are our officials seriously endeavoring to earn for themselves a like reputation for honesty and sagacity?

Chicago to Liverpool Direct.

There are two great natural outlets, and only two, by which the grain and other heavy products of the interior of our country may find their way to tide water. The first is through the Mississippi river, the second through the St. Lawrence. Through the foresight and sagacity mainly of a single individual, De Witt Clinton, an artificial channel was constructed a few years ago connecting the upper lakes with the Hudson, and this, the Erie Canal, has become one of the most important avenues. Although purely artificial for a length of between 300 and 400 miles, the navigation of the river with which it connects is so easy that the whole cost of forming by this means a ready transportation from all points on the lakes to this metropolis has been little, if any, greater than that of improving the St. Lawrence, and of constructing canals and locks to enable vessels to pass around the Falls of Niagara, and around the various rapids which obstruct that route. Those improvements are now so perfect, however, that vessels of a sufficient size to navigate the stormy Atlantic with tolerable safety can pass through all the locks, and transport goods, without re-shipment, from Lake Michigan to the Mersey. The *Dean Richmond* took a heavy load of grain direct from the wharves at Chicago to the docks at Liverpool, last year, and the details of her log, showing how many days were spent in each lake, how many in being towed through each canal, how many in navigating the lower portion of the river St. Lawrence, and how many on the broad Atlantic, as also the expense attending each portion of the undertaking, has been published in a large number of the leading journals in Great Britain, and in several on this side of the water. The enterprise did not pay, nor can it be made to appear likely that this mode of exporting grain will supersede the present system at any very early day, though it induces all parties to open their eyes to the fact that such an event is possible. A few improvements, perhaps a single one, pointed in some unexpected direction may turn the scale, and compel New York to forego all the great trade and wealth derived from the great mass either of the export or import business of the West.

Last week a ship, the *Madeira Pet*, was reported as having arrived at Chicago from Liverpool direct, being the first vessel ever sent from England to Chicago. She was laden with a cargo of crockery, hardware, oils, paints, &c., species of goods which are more expensive and destructive to handle than grain, and in the conveyance of which it is consequently more important to adopt such a system. Grain is now taken out of the mammoth lake propellers or sailing vessels, and deposited in canal boats by means of "elevators," with very great facility; and after being towed by horses through the canal to the Albany basin, and by steamers down the river, and across the upper extremity of our harbor to the Atlantic docks, is again unloaded by similar means into warehouses, mills, or large vessels, with no waste, and at an expense almost too small for notice.

We should remark that the outlet for produce *via* the Mississippi, although easier than either of the others, is objectionable on account of the temperature in the southern latitudes, and that we have left the railroads out of consideration, as they cannot compete in slow heavy freights. The conditions of our country and of the world in respect to production, transportation and consumption, belong properly to both science and political economy, and when a port of entry some two thousand miles from tide water, becomes the point to receive even a "Pet" ship-load of manufactures direct from British wharves, it seems an event worthy of notice by all.—Pittsburg years ago manufactured war steamers for our Navy, and floated them down the river on the spring floods; but ocean navigation to the upper lakes is a quite recent "institution."

Science and Arctic Voyages.

The explorations of the northern coasts of America in search of a northern, or, as it is generally termed in Great Britain, a "Northwest Passage" to the Pacific, have been pretty effectually discontinued. If there is an open sea extending over the parts yet unreached, there may, at some future period, be inducements to explore it, but at present the voyage round the almost equally dreary "Horn," sailing or steam-towing through the rocky Straits of Magellan, a canal along some line between the northern and southern continents, the Panama Railroad, Pacific Railroad, and Pacific wagon road; some or all of these seem far more practicable, profitable, and in every sense, more desirable, than attempts to crush a passage through ice floes in the Arctic Ocean. The search for Sir John Franklin's party—commenced this year by a small propeller from England, the sides of which are *very flaring, to induce the vessel to rise when pinched in the ice*—is probably the last which will be undertaken, even if the hope to find important traces or even records of the lost explorers should be fully realized.

But it is none the less true that the explorations of the last ten years have added to the wealth of the world, by furnishing important scientific information. In regard to its small amount, as compared to the cost of its acquirement, we would protest, in the language of a recent writer in the *Massachusetts Teacher*, against looking at knowledge from a mere *commercial* point of view. We ignore, entirely, the price current that shall give us, in dollars and cents, the market value of the discovery of the circulation of the blood, or the binomial theorem; the magnetic telegraph, or the laws of the trade-winds; the sources of the Niger, the cotton gin, or the steam engine. Such views are unworthy of an age of intelligence. Knowledge has other uses besides that of supplying the wants of the body, and its mission is infinitely higher than the gratification of a sordid love of money.

Within the last forty years a coast line of more than four thousand miles, in those regions, has been examined and accurately laid down upon navigators' charts; and to this we may now add that examined by the recent expedition of the late Dr. Kane, the results of which expedition are very considerable, and especially valuable for their accuracy and correctness. In North Greenland and the vicinity of Smith's Sound, nearly one hundred localities, such as capes, mountains, islands, bays, &c., were visited and determined with the utmost precision. Northern British America has been thoroughly explored, and nearly every feature of the country and climate between the Great Lakes and the Frozen Ocean has been carefully noted by keen observers. The Northwest Passage, that problem of ages, long and painfully sought for, has been tolerably well proved to exist.

Terrestrial magnetism and the variation of the magnetic needle; astronomical observations and experiments with the pendulum for ascertaining the true form of the earth; ocean soundings and the freezing of salt water; records of the weather and the course of atmospheric circulation, are subjects which have received much attention. Two expeditions alone, some years since, gave us a knowledge of more than twenty families of plants of the natural order. Unaccustomed as we are to associate vegetation with the ice-bound North, it is nevertheless true, that the botany of Greenland enumerates more than two hundred and sixty species.

The discovery of a stinted shrub or an unknown moss, in Spitzbergen or North Greenland, or the examination of a limestone cliff on the shores of Coronation Gulf, may, as isolated facts, be unimportant; but in the hands of the botanist and the geologist they may supply a vacancy in classification, or throw additional light upon the conditions of vegetable existence and the structure of the earth, of inestimable value. In these days of pomological and horticultural conventions, scientific agriculture, and universal Chinese sugar cane *furor*, we need use no special pleading to convince the reader of the importance of extending our investigations in the sciences of botany and geology, theoretical and practical.

England, through her Board of Admiralty, has recently discarded her own charts of Baffin's Sea and adjacent waters, and adopted instead, those prepared from the observations of the late Dr. Kane—a graceful tribute to their accuracy, and a fitting acknowledgment of the importance of this kind of information.

By reading the account of Dr. Kane's expedition, every person who has to encounter the severity of even a New England winter, will be furnished with a better knowledge of the powers and requisites of his system to meet and to withstand, successfully, the hostile elements and vicissitudes of climate to which he is inevitably exposed. The experience of Dr. Kane and his companions in subsisting upon scurvy grass and the coarse meat of the walrus and seal, is worth more to the physiologist than a volume of mere theories upon animal heat. Indeed, every person, unwittingly it may be, becomes a sharer in the common good derived from the explorations which are now apparently so unsuccessfully being terminated.

Freighting Oil.

In all the endeavors to find a route for a canal across either the Isthmus of Darien or of Tehuantepec, the transportion of oil from the great number of vessels employed in whale fishing in the Pacific has always been looked to as an important item of the business to be anticipated; but we have never heard it proposed to convey oil across the Isthmus by the Panama Railroad until a few days since, when we learned that a New Bedford whaler had just sent home a considerable cargo by that means. It is well known that our government recently availed itself of this mode of exchanging the crew of a war vessel stationed on the Pacific, and with judicious management by all parties, this means of saving the long and dreary voyage around the whole continent of South America may soon become quite popular.

A novel and ingenious method of avoiding the greater or less amount of waste always attending the carriage of oil, has been lately adopted by a concern in New Bedford, in putting up some 170 casks for transportation in the other direction to supply the United States lighthouses on the Pacific coast. Barrels containing 31 gallons were placed in strong casks of 45 gallons capacity, and the vacant space between filled with water. This arrangement will probably preserve every drop, as there is no leakage from the interior so long as an equal pressure exists on the outside, and water being much more easily retained in casks than oil, there will be too little escape from the water casks to be worthy of notice.

Death of a Distinguished Chemist.

Professor Mitchell, the State Geologist of North Carolina, recently went out alone on a professional examination of the Black Mountains in that State, and did not return. His body has since been found. It seems that he was walking on the edge of a precipice when his feet slipped, he caught at a branch of laurel, but it broke, and he fell. To his exertions the prosperity of the State is as much due as to any other man. He died a martyr to science and scientific knowledge.

The Crops.

Although the weather has been very cold during the early portion of this season, the prospect for crops is quite encouraging. Wheat and corn in the West and South are excellent. Cotton is said to be tolerable, but Wright's weekly cotton circular affirms that the season is three weeks later than usual. The sugar crop of Louisiana will be four times as much as last year.

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Cheap Plating of Iron with Copper.

A cheap and perfectly reliable method of plating either cast or wrought iron with copper, so as to effectually protect it from sea water, or even from the less powerfully corrosive action of the weather, is a desideratum which has long been sought for; and there are now in use, with some slight degree of success, several processes aiming to attain this end. A late number of Dingler's *Polytechnische Journal* describes a device for coppering iron castings of a large surface, such as chairs and tables, and also large wrought iron articles, by a galvanic process, of which we will attempt to present a condensed translation.

It is well known that iron castings, having been cleaned upon the surface and coppered by the ordinary electro-chemical process, soon become covered with rust, which penetrates the more or less felt-like copper coating. The porous and imperfect character of the copper covering is probably due to the retention of small quantities of the sulphate of copper (blue vitriol) employed in cleaning the iron. M. Oudry, the inventor of the process here described, employs no such chemical in the preparation of the articles to be protected, but simply submerges them in a very thin and quick drying varnish, and then, after allowing them to dry for about one hour in the open air, covers them with a coating of graphite (black lead) to render the surfaces perfect conductors of electricity, and suspends them in a bath of sulphate of copper. He connects the zinc so that, unlike the ordinary process, the articles to be plated form one pole of the battery which performs the operation. By this means a thin stratum of varnish is made to intervene between the iron and the copper coating—a fact of considerable benefit for the bottom plates of iron vessels, as it tends to prevent any possibility of the two metals forming an active galvanic current after their submersion in the sea.

M. Oudry has, in his factory at Autenil, near Paris, vats eighteen feet long, seven feet wide, and nine feet deep, to receive the articles to be plated. These, as before described, contain sulphate of copper; and as it would be difficult to produce porous earthen vessels of sufficient size to contain the zinc bath within this, in the usual manner, he uses bags of canvas instead—taking care to have the material woven so tightly as to prevent any sensible mingling of the copper sulphate with the diluted acid or salt water contained within. M. Oudry makes these bags or sacks about four feet deep, and from twelve to fourteen inches in diameter, and distends them by inserting a cylinder or basket of woven willow. Within this latter he inserts the negative metal—a sheet of zinc rolled up until the edges meet and form a cylinder. He has by this process coppered bolts, hinges, various heavy masses used in ship-building, gas lanterns, *lamp posts*, and iron bedsteads. By this process, which he terms "direct," as he uses no other elements than those described, coppering can be done far better than heretofore, and at only about three-fifths the former cost.

Purifying Sugar by Alumina.

Referring to our notice on page 355, this volume, Scientific American, in which we detail M. Mene's success in purifying and decolorizing sugar by the use of a preparation of alum, Dr. Fr. Gerau, of this city, gives the results of experiments tried some two years ago, and repeated since the appearance of our article, from which it appears, first, that sugar cannot be entirely decolorized even by the use of repeated quantities of alumina; second, that the alumina is considerably more expensive and of less effect than than the bone black or charcoal prepared from animal substances which is usually employed; and third, that while bone black may be reburnt and used over again from thirty to fifty times, the preparations of alumina cannot be used but once. As the subject is one of great practical importance, we give the concluding portion of his letter in full:—

"I do not believe that, in practice, precipitate of alumina can so effectually be freed from the alkali by washing, that it does not materially endanger the sugar in the act of crystalizing—in other words, change it into grape sugar. Every chemist knows that even small quantities of alumina cannot be perfectly cleaned of the alkali even by long-continued washing. Alumina may be used to more advantage for this purpose, if, after mixing it with equal parts of bituminous coal and clay, it is subjected to a red heat, as is done with animal bones for animal charcoal. By this means an artificial bone black of equal power with the natural may be obtained, and one that, like it, is capable of being resuscitated, but which would be too expensive. Every substance that is very porous may be used for the same purpose. I have found precipitated phosphate of lime to be superior to any other. Carbonate of magnesia is also excellent for the same end; but these materials become entirely ineffective when they are made red hot, before mixing them with the other ingredients. A great many soluble salts that melt at high temperatures are good ingredients for a like discolorizing mixture, provided they do not become insoluble or otherwise decomposed by re-heating them with the bituminous coal in a manner objectionable to their use in sugar refining."

A Triumph of American Reapers in Hungary.

We have received from Messrs. Burgess & Key, of London, a copy of the *Mark Lane Express*, containing an account of the great agricultural show at Budapest, Hungary, which extended from the 6th to the 11th of June. So strong was the desire to do business, on the part of the Hungarians, according to the report of the above paper, that several of the English exhibitors were occupied up to the last hour, either in taking orders or in sending away what they had sold. The desire was very great, on the part of the Hungarian proprietors, to possess themselves of labor-saving machines of the best construction, from the necessity of adopting the most economic means of cultivating the soil, now that the peasant is free, and hand-labor exceedingly scarce and high-priced. The Hungarians give large orders for implements when they thoroughly approve of them, as their estates are very extensive. A landed proprietor, for instance, thinks little of ordering twenty, fifty, or even a hundred plows at once; and if his land is in pretty good condition, it is common to find either three or four steam engines and threshing machines on the estate, with others in due proportion, to correspond with the necessities of what they consider ordinary cultivation.

The trial of reapers took place in a field of rye, about four miles from Pest. The Archduke Albert and several of the leading functionaries of state attended to watch the proceedings. The field was crowded by the leading landed proprietors and farmers, who had bought largely of machinery for agricultural purposes, and who paid great attention to the respective operations of the reapers. There were only three reapers on the ground—one by Baron Ward, a second by M. Szabo, of Pest, and the third, Burgess & Key's improved McCormick.

Messrs. B. & K. are agents for, and manufacturers of, McCormick's American Reaper, and have added an improvement of their own, an Archimedean Screw Platform, which delivers the corn in a continuous swath, a desirable invention where the crops are heavy, and one which they have patented in this country, and propose soon to introduce here. On this trial, the reapers were drawn sometimes by oxen, and sometimes by horses, in order to test their working powers under different circumstances. Szabo's machine very quickly got choked, and had to retire from the field. The delivery was by endless bands, moving horizontally, but it did its work so clumsily, and required such a heavy draft, that it was at once pronounced a failure. Baron Ward's machine did its work very fairly; but, independently of requiring four horses or oxen to draw it, and frequently leaping over the corn, and leaving large patches, not cut, but trampled down, it required two men to rake off what it cut, and such was the severity of labor that no two men of ordinary strength could last a couple of hours at such work. The interest, therefore, was naturally concentrated upon Burgess & Key's English-American machine, which required but two horses or oxen, and in the language of the reporter went "far beyond what was expected of it," and in the opinion of the judges "showed superiority both in the work done, and in the power consumed." The whole company are described as "taking off their hats and giving a hearty cheer" for the successful machine.

Tests of Flour.

The *Ohio Farmer* publishes the following modes of observing the quality of flour, as furnished by an old flour dealer. Most of them are already known, we presume, to the mass of our readers, but it may do no harm to extend the information. We regret that the ancient trader did not show what particular qualities are indicated by each test, as we have always imagined that more importance is attached to color than is due as an indication of quality:—

"Look at its color; if it is white, with a slightly yellowish or straw-colored tint, it is a good sign. If it is very white, with a bluish cast, or with black specks in it, the flour is not good.

Examine its adhesiveness; wet and knead a little of it between the fingers. If it works dry and elastic it is good; if it works soft and sticky it is poor. Flour made from spring wheat is likely to be sticky.

Throw a little lump of dry flour against a dry, smooth, perpendicular surface; if it adheres in a lump, the flour has life in it; if it falls like powder, it is bad.

Squeeze some of the flour in your hand; if it retains the shape given by pressure, that, too, is a good sign."

A recent communication from respectable parties in Philadelphia to the Alms House Department of that city, although conveying but a meager amount of information on the same subject, seems entitled to attention. They assert that though not generally known to persons out of the trade, it is a fact that some barrels of flour, bearing the same inspection mark of superfine, and examined by the same Inspector, will make from thirty to forty loaves of bread more, and consequently worth to the consumer $1·50 to $2 per barrel more than other flour of the same inspection quality marked thereon, but which can only be detected by judges. In view of the above facts, which any baker can testify to, these parties offer, for a commission, to select flour at lowest market prices, that on trial, and comparing bills, will save to the treasury $150 per week.

Health of Cities.

At a recent meeting of a committee appointed to investigate the condition of the streets and the like, held in this city, a statement was presented by Dr. Winne respecting the sanitary condition of cities, which he has made the subject, in a variety of ways, of the most careful study and research. The number of deaths annually present the following ratio to the whole population:—

London	1 in 41
Liverpool	1 in 29
Manchester	1 in 20
Paris	1 in 33
Boston	1 in 32
Lowell	1 in 50
Baltimore	1 in 40
Charleston	1 in 40
Savannah	1 in 33
New York	1 in 34

Dr. Winne holds the belief that in spite of modern improvements, water, ice, better information, &c., from the year 1810 to 1855, New York has declined in health, and the rate of mortality has been increasing. This is contrary to what we have always believed, and if true, seems deserving of much attention.

Public Buildings.

We have received from A. Kollner, the distinguished lithographer of Philadelphia, a splendid set of drawings of various public buildings now in course of construction or very recently completed. We shall probably recur to the subject again.

The report that the marble walls of the capitol at Washington had proved too weak to bear the new iron dome, it appears must be set down as a hoax. No indications of the kind have been yet observed.

The Calmest Season.

Lieut. Maury in his new edition of Wind and Current Charts, says:—

"I have gone into an investigation of the abstract logs for the purpose of ascertaining the most tranquil and favorable time for laying the Sub-Atlantic Telegraph, with reference to gales, fogs and ice. The season that presents the most favorable combination of these is also the most favorable season for passenger travel across the Atlantic, and that season is found to be about the last of July and first of August. This part of the ocean is most tranquil in summer. Taking averages, we have in it fewer gales, but more fogs and ice in June than in July or August, but fewer fogs and least ice in August. The last of July and first of August appear to be the most favorable time for laying the Sub-Atlantic Telegraph. This information may be useful to invalids and others crossing the Atlantic, as well as those engaged in that enterprise."

Dry Docks.

The dry dock at the Charlestown Navy Yard is being enlarged. It is a substantial structure of masonry commenced in 1827, and finished in 1834. Its floor is now 228 feet long, and 36 feet wide, and 30 feet deep. By blocking up a vessel to the level of the miter sills, the whole space (50 feet long) between the turning gates or true gates and the outside caissoon or floating gate can be made available so as to dock very large vessels. The enlargement now just commenced will make this immense structure forty feet longer.

The floor of the Brooklyn naval dry dock is 260 feet long and 50 feet wide, with a depth of 31 feet, and the ability to receive vessels longer by including the additional length to the outer gate, 60 feet. It has docked the *Niagara*, the longest war vessel in the world.

A New Use for Ether.

The process of etherization has just been resorted to in Belgium as a means of acquiring judicial information. After a considerable robbery, two men were arrested and brought to trial. The former was condemned to hard labor for life, but in consequence of the latter pretending to be dumb and idiotic, his trial was postponed. It was found impossible to get even a sign of intelligence from him; but, on a medical investigation, he was etherized, and while laboring under the effect of that application he spoke perfectly and in French. He was in consequence again brought before the tribunal, and condemned to ten years' hard labor.

The Tide of Emigration.

The British government have established lines of steamers between England and Canada, but it seems that a large number of English and Irish who land in Canada pass on to the Western States in preference to settling in the provinces. From the returns made by the emigration agent in Hamilton, C. W., it appears that the total arrivals at that city since January 1, are 21,982, while the number who have left for the United States is 19,432, so that there is left remaining in Canada only 2,550, or about one-eighth of the whole.

Post Office Revenue.

The gross revenue of the Post Office Department for the quarter ending March 31, was $1,890,000·16—net revenue, $1,026,936. The Postmaster General will soon establish in New York and Boston the London and Paris system of Branch Post Offices. Should the plan be satisfactory after a year's trial, it will be applied to all the large cities of the Union. The Department thinks the overland route to California will be in operation within twelve months.

Cherry Currants.

Messrs. Wells & Provost, on a farm near Yonkers, N. Y., have thirty acres devoted to the culture of a species of currants bearing the above name, a sample of which sent us we find to be nine-sixteenths of an inch in diameter, measured accurately by calipers. One cluster of these currants is reported to have been fifteen inches long, and to have contained nearly three hundred perfectly formed fruit. These gentlemen dispose of their fruit by preserving it in self-sealing cans.

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W. H W., of Ill.—Postmasters have a right to charge what they please for rent of boxes, or not to provide any if they choose; but the people have also the right to forego the advantages due to such boxes, and to wait till the Postmaster can search out their letters or papers as they apply. The Postmaster cannot compel you to hire a box, except by maliciously or lazily delaying to wait on you in the ordinary manner.

Progress.—Give us your address, and we will answer you in full. Your design is probably patentable.

C. Z. H., of Tenn.—We do not know the best machines for grinding cement. Address the Rosendale Cement Company. Livermore's barrel machinery is the best in use we think.

W. C., of Ill.—The earth certainly absorbs a portion of the light and heat thrown off by the sun, but it is only a very small portion. Far more than 99 per cent of all the light and heat radiated must be thrown off into space, and it is difficult to see any medium by which it can ever be returned.

S. N., of La.—Rich's water wheel patent issued July 8, 1312, and expired in July of last year. The Patent report which will soon be issued, will inform you if it has been extended, or you can learn immediately by writing to the Commissioner.

H. & M., of Va.—Simmons is correct. Your last pulley will revolve 64 times for one revolution of A. It is better in calculating gearing to reckon by the number of teeth instead of the diameter of the wheels. Your mistake is in allowing twice for the great size of the wheel C.

J. B. L., of N. Y.—You may be correct in your surmises in regard to the "fish catching secret," but as we know nothing of the art, we cannot pronounce judgment upon it.

John Anderson, of Middleton Point, N. J, wishes to communicate with some patentee in reference to the best device for attaching wagon shafts to axles.

James Lord, of Erie, Pa., wishes to procure a machine for water-waving silk.

A. D. R., of Ohio.—We are unacquainted with the qualifications required to enter the Navy. If you address a letter of inquiry to Hon. Isaac Toucey, Secretary of the Navy, Washington, we have no doubt you will receive the proper advice.

J. R. R., of Ohio.—There are not in use any indicators of the speed of railroad trains, either recording or otherwise, and there is a chance for a valuable invention in that line. The present means of ascertaining speeds lie in the "judgment" entirely of the engineer, and although an experienced man, familiar with his road, and aided by a good clock before him, can determine pretty correctly, an instrument which will both indicate and record would be valuable. Send the sketches.

J. W. D., of Ga.—The manufacture of oil from coal is carried on to a greater or less extent by several companies—one of the principal is the Messrs. Cairns, of Cloverfort, Ky. John Thompson, No. 2 Wall street, is the agent.

J. M F., of Ind.—We cannot tell whether your invention is patentable until you describe its construction and operation, and the description should be accompanied by a drawing. There are machines in use in England for laying draining tiles underground, which operate somewhat as you propose. There is nothing new in enclosing telegraph wires in a tube when laid underground.

N. F. Jr., of Mass—Sawing wood and churning by a railway horse power is perfectly practicable, and will "pay," if there is enough of such work to be done on your farm. How much is required to make such assistance profitable must depend very much on the degree of ingenuity and skill of the farmer himself. "Contriving is better than hard work" is an old saying and a true one, but where none of the former exists, the latter must supply its place. We think no machinery for milking cows is in extensive use.

M. E., of Pa.—You are not obliged to use all the claims covered by your patent. You are undoubtedly protected in the use of any one or more of them.

A. S., of N. H.—We do not know where you can procure aluminum in this country. A chemist in New Jersey has produced it, but we do not recollect his address.

W. N. M., of Va.—You inquire if flour will bolt as well immediately from the burrs as if passing some distance before entering the cloth; or how would it do to pass through a conveyor, eight or ten feet long, and thence be elevated ten feet to enter the bolt? It is quite common to pass flour through conveyors before bolting it. It will bolt much better by being thus conveyed, as it will then become cool. The yield will also be better.

S. B., of Ohio.—We are unable to give the information you seek in regard to any substance that will entirely prevent the needle of a compass on ship-board from being attracted by local magnetic currents. The prospectus of Volume 13 will soon be out. Do all you can for us.

J. R. H., of Mo.—It is not time for your case to be acted upon yet. As soon as we learn anything from it which will interest you, we will communicate.

J. F., of Va.—We consider the engines made by Corliss & Nightingale, of Providence, R. I., the most economical of fuel in the world, but their style does not apply to very small ones.

T. B. C., of Ill.—We submitted your inquiry to Messrs. Ball, Black & Co., and they state that if your pearl is of fine quality and of the size you specify, it is worth $25 or $30. It is no wonder you do not get your paper. Your subscription expired six weeks ago.

C. G. M., of S. C.—Write to N. W. Lincoln, agent of the Boston Cork Company, 69 Commercial street, Boston, and he will answer your inquiries. We are in receipt of some fine specimens of corks from their manufactory, and understand they are prepared to furnish everything of the cork description, from vial corks up to life buoy mattresses, &c.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, July 25, 1857:—

J. P., of Mich., $60; J. G. H., of N. J., $45; J. N. W., of Ill., $30; T. S., of Tenn, $30; C. C. S., of Vt., $25; J. H. B., of Mich., $40; A. W., of N. H., $25; W. W., of Mass., $25; W. & H., of Ala., $25; J. C., of Ill., $25; W. J., of Ill., $30; S. L., of N. Y., $27; A. S., of N. Y., $30; C. A. W., of Mass., $179; C. C., of Pa., $60; S. L. W., of Pa., $400; G. B. P., of N. Y., $25; W. H., of Wis., $15; E. L. G., of Conn., $25, J. S. B., of N. H., $250; B. C., of N. Y., $30; J. G., of Miss., $60; U. H., of Conn., $25; E. H. B., of Mass., $27; T. J. P., of Ill., $25; J. L. A, of N. Y., $25; M. W. H., of Ind., $25; W. W. L., of Miss., $15; B. F. S., of Vt., $30; McN. & C., of N. Y., $25; N. F. W., of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, July 25, 1857:—

A. W., of N. H.; J. H. B., of Mich.; W. W., of Mass.; C. C. S., of Vt.; J. C., of Ill.; W. J. S., of N. Y.; McN. & C., of N. Y.. W. B., of Ill.; P. C., of Conn.; N. F. W., of L. I.; G. B. P., of N. Y.; W. H., of Wis.; J. H. of Ala.; E. L. G., of Conn.; W. F. & R., of Ky.; T. J. P., of Ind.; T. W. R., of N. Y., (2 cases).

BACK NUMBERS OF THE PRESENT VOLUME—Almost every mail brings letters of inquiry from our patrons for certain numbers of the SCIENTIFIC AMERICAN, which we are unable to supply. To save subscribers the trouble of writing for such numbers as we have not got, we append a list of the numbers which are entirely exhausted in Vol. 12:—1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 27, 30, 31, 35, 35, 39. Those numbers that are not specified above we can supply, and shall be happy to do so to those who have missed them.

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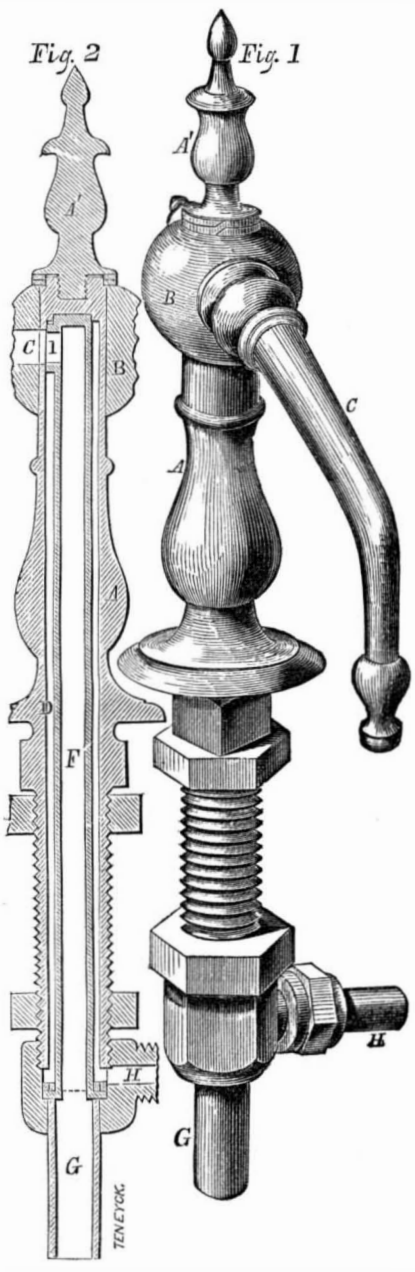
Science and Art.

Improved Basin Cock.

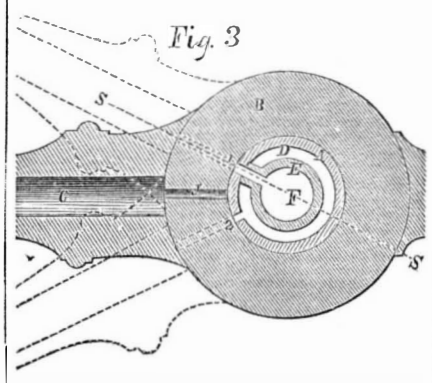
The accompanying engraving represents a cock which discharges either hot or cold water, according to the position in which it is turned. It is the invention of William C. Marshall and Horace W. Smith, of Hartford, Conn. It requires, of course, two pipes to put it in connection with the supplies of water at the different temperature. The hot water is led in through the vertical passage seen at the extreme base of the figure, and the cold water through the horizontal opening represented a little above.

Fig. 1 is a perspective view, and Fig. 2 a vertical section. Fig. 3 is an horizontal section through the ball or top. A is the body of the cock, of any ordinary material. B is the ball, capable of being rotated horizontally. C is the nozzle, or ordinary curved



pipe, through which the water, whether hot or cold, is discharged. D is a large water space or passage through the center of the body A. E is a small tube enclosed within D, and F is the bore or space in the interior of this inside tube. G is the connection or pipe which admits hot water into the interior, F. H is the horizontal pipe referred to, which leads cold water into the annular space D. It will, of course, be understood that the intimate contact of the hot and cold water within the cock will reduce each other to a mean temperature when the cock is allowed to stand with out discharging for any consider able time, but this equality of temperature will only obtain in the very small quantity contained within the body A, and consequently when the cock is turned into such position as to discharge either from the central opening or the annular space around it, the water, though at first lukewarm, soon commences to flow in a condition approximating very nearly to the temperature of that in the corresponding pipes, G or H.

J is the discharge opening in the side of the ball B. It will be observed that there is a corresponding neck, or lateral projection, from the side of the inside tube E, near its top. The inside tube E, does not turn or rotate with the motion of the ball B, but always presents its neck or side opening in one direction. As the ball B is turned by grasping the



nozzle or spout C, with the hand, the discharge aperture J, may be brought into correspondence with the side opening in E, and in this position the nozzle C will discharge hot water, the flow being entirely through the central space F. This condition is represented in Fig. 3 by the dotted lines 1, but by turning the cock into such position that the aperture J, connects with the annular water space D, as shown by the dotted lines 2, in Fig. 3, the discharge is entirely from the annular space, and the water consequently issues cold. With the parts in the position represented by the strong lines in Fig. 3, neither passage will discharge water. It will, therefore, be seen that the cock refuses to discharge when the nozzle C, is either over the center of the basin, or turned too much to either side; but when the nozzle C, is in an oblique position, or just within the edge of the basin on either side, the discharge will be rapid, and either hot or cold, according to which side it is over.

This invention was patented on the 9th of June, 1857. For further information the inventors may be addressed as above.

Heated Galvanic Battery.

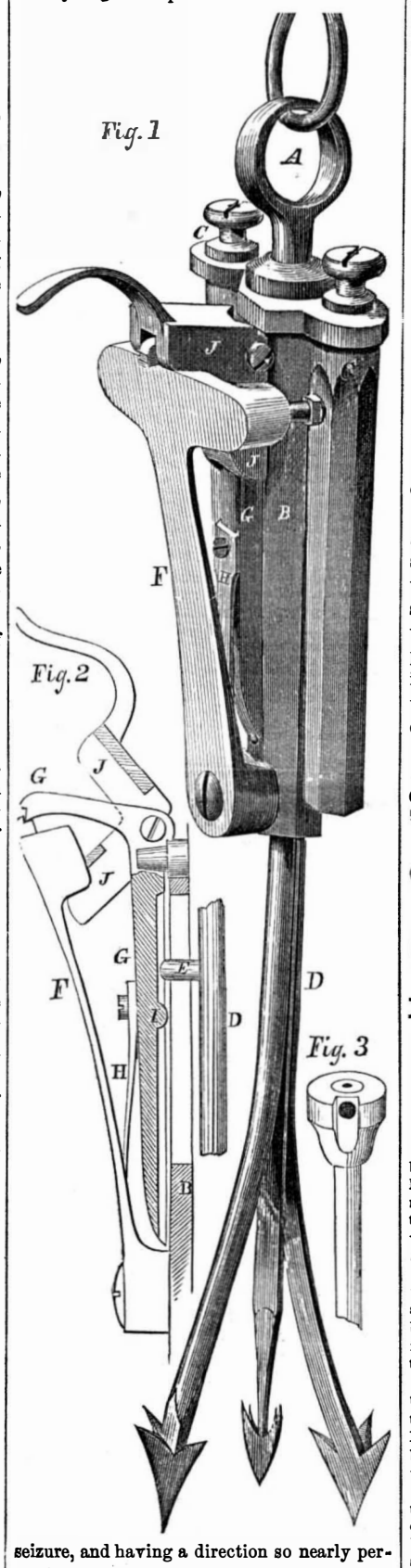
C. Kuhns, of Munich, Bavaria, Inventor. Long continued experiments have shown that the current of a copper and zinc battery is much more constant, and from one and-a-half to two times stronger than usual, if the same is heated gradually to about 120° Fah., during the process of the operation. His experiments also induce a belief that a battery gives out the strongest current, not, as generally believed, with the largest possible surface of zinc connected with a given surface of copper, but by using just a proper quantity of zinc—ascertainable only by experiment in any given instance. In constructing his batteries he uses two or three hollow copper cylinders inserted one within the other, leaving a space of one-eighth of an inch between them, and connects these cylinders by several strips of copper. The interior one encloses the porous earthen vessel which receives the zinc. Instead of using sheet zinc, the inventor uses short pieces of amalgamated zinc wire, three-sixteenths to one-quarter of an inch in diameter, having small wires soldered to them, by which these several pieces of zinc may be connected. By these means he is enabled to readily add to or reduce the surface of zinc, and to use just such a quantity as gives out the strongest current.

To be able to heat his battery, he divides his box, by a strong cast-iron plate, into two compartments, one above the other. All the elements are put into the upper compartment, which latter, of course, is divided into the necessary number of smaller compartments, each containing a cylindrical glass vessel to receive the element. The spaces between these latter compartments are filled with sand. The lower compartment of the box receives an alcohol lamp, which heats the whole battery. By using warm water in composing his battery, a heating of half an hour's duration is sufficient to bring the battery to the required temperature, and it retains such after removal of the lamp for several hours, if the heat be preserved by a suitable cover, so as to require no very great outlay for fuel.—*Translated from Dingler's Polytechnisch Journal.*

Reuthe's Animal Trap.

The device here represented is the invention of Frederick Reuthe, of Hartford, Conn., and was patented May 12, 1857. It is a spring gun, designed to capture wild animals in a manner which shall be certain in its operation, and present as little liability as possible of destroying human life.

There are two guns or pistols combined in one instrument, and fired at the same moment, so that in case either should fail to be discharged, or from any cause fail to produce a fatal effect, the other may be effective. It is designed to be hung up by a chain to a tree, fence, or other sufficiently strong support, and at such a hight that the animal must jump slightly to reach it, thus insuring a very vigorous pull at the moment of its



seizure, and having a direction so nearly perpendicular that no mischance can cause it to do injury. It is intended to apply equally to the destruction of bears, panthers, and the like powerful animals, or to the capture of foxes, and small animals valuable only for their skins; but the machine or trap must, of course, be of a size somewhat proportionate to the animal for which it is intended. The meat or bait is fixed on a strong barbed and forked tongue, the parts of which separate by their own elasticity, and would themselves be sufficient, in many cases, to retain the animal alive for many hours, or perhaps days, supposing the gun-barrels to be unloaded.

Fig. 1 is a perspective view of the machine complete, with the hammer down, and the tongue drawn out, in short, in a discharged condition. Fig. 2 is a sectional outline through the center of the principal parts, with the hammer up, and the trap ready for action. Fig. 3 is simply an outline of the ramrod. A, figs. 1 and 2, represents a stout ring, to which the chain is attached. B is the frame or hollow case, which forms the central portion, and C C are the two gun barrels fitted with nipples and caps, in the ordinary manner. D is the forked tongue referred to, and E a point on the same, projecting upwards through a slot in B, so that as the tongue, D, is drawn out, the point, E, travels longitudinally down the slot. F is a stout spring fixed on B, and enlarged on the upper end to form a double hammer, for discharging the caps by percussion. G is a bell-cranked lever, hinged to B. Its short arm is adapted to retain or hold up the spring or hammer F, while its longer arm lies nearly parallel to B, and has a groove in its under surface, in which E is allowed to travel. I is a cam-like projection on the under surface of G, which is acted on by the point E, on the forked-tongued D, in such a manner as to move G, and release the spring or hammer, and discharge the guns. H is a small spring secured on the back on the long arm of G, and which serves the purpose of holding G in tolerably tight contact with B. J is a stout bell-cranked lever, which is only useful in cocking the piece, or elevating the spring hammer F, to the proper extent. The operation of loading the barrels is conducted in the ordinary manner, the ramrod being peculiarly formed, as represented, in order to serve a double purpose—that of the ordinary ramrod, (fig. 3), and also of a wrench, to unscrew the nipples, when desired, for the purpose of repairs, etc. The spring F is quite stiff, and urges the hammer with considerable violence against the caps, so that there is little danger of failure from want of sufficient force. The caps are waterproof, and as an additional protection against injury from the weather, the whole is covered with a piece of leather, or tight oilcloth, hung on the chain above.

For further particulars the inventor may be addressed at Colt's pistol factory, Hartford, Conn.

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